

*Two General Propositions in the Method of Differences.* By Thomas Knight, Esq. Communicated by Taylor Combe, Esq. Sec. R.S. Read February 27, 1817. [*Phil. Trans.* 1817, p. 234.]

*Note respecting the Demonstration of the Binomial Theorem inserted in the last Volume of the Philosophical Transactions.* By Thomas Knight, Esq. Communicated by Taylor Combe, Esq. Sec. R.S. Read April 17, 1817. [*Phil. Trans.* 1817, p. 245.]

In this note the author expresses his regret at finding that the demonstration of the binomial theorem, and the first proposition of his paper on the construction of logarithms, formerly presented to the Royal Society, had been previously given by Mr. Spence in his *Essay on Logarithmic Transcendents*. This author, however, says Mr. Knight, is not particularly happy in the manner of developing the kind of functions treated of in his preface, and therefore in the present note gives a solution of a class of equations of which Mr. Spence has considered a particular case, without however resolving.

*On the Passage of the Ovum from the Ovarium to the Uterus in Women.* By Sir Everard Home, Bart. V.P.R.S. Read May 1, 1817. [*Phil. Trans.* 1817, p. 252.]

No physiological subject has attracted more attention than the first formation of the embryo in the class Mammalia; and although it has been ascertained that an ovum is formed in the ovarium of the quadruped, the circumstances respecting its impregnation have not been ascertained. Harvey, and John and William Hunter, have each failed in this inquiry; Haighton and Cruikshank were equally unsuccessful. In this state of our knowledge, says Sir Everard Home, accident has led to that which no predetermined experiments could have accomplished, and has enabled me to detect the ovum in the human uterus. It is so small, that had not the uterus been previously hardened in spirit, it would probably have escaped observation; and, says the author, it would have been difficultly identified as the ovum from which a child was to be produced, had it not been for the assistance of Mr. Bauer, the only person who could so correctly apply the powers of the microscope as to enable him accurately to delineate its organization.

The history of the case and dissection is as follows.

A servant maid, twenty-one years of age, left her master's house the 7th of January, 1817, for several hours in the forenoon. On returning in the evening she complained of sickness, and went to bed. Next day she continued unwell. The period of menstruation had arrived, but did not come on. She appeared much distressed in her mind. On the 13th she had an epileptic fit, became delirious, and died on the 15th. On examining the uterus it showed signs of pregnancy; and circumstances proved that she must have been impregnated on the 7th of January, that is eight days before her death.

The right ovary had a small torn orifice upon the most prominent part of its external surface, which led to a cavity filled up with coagulated blood, and surrounded by a yellowish organized structure. The inner surface of the uterus was covered with coagulable lymph, among the fibres of which, near the cervix, was the ovum. It was oval-shaped; and though at first partly semitransparent, became opaque from the action of the spirit. It was immediately taken to Mr. Bauer, who compared it to the egg of an insect, and succeeded in pointing out the effects of impregnation in two projecting points, the rudiments of the heart and brain.

The corpus luteum has always been regarded as the effect of impregnation,—a notion which the present case has enabled the author to disprove, by showing it to be a glandular structure in which the ovum is formed; and after its expulsion the blood which fills the cavity is absorbed, leaving a small empty space as the former situation of the ovum.

Sir Everard Home examined several ovaria, where it was impossible that impregnation should ever have taken place, and found small cavities round the edge of the ovary, showing that during the state of virginity ova had passed out. And it appears, that whenever a female quadruped is in heat, one or more ova pass into the uterus, whether she receives the male or not.

In the drawings belonging to this paper, the changes which take place in the ovary, for the purpose of forming the ova, are shown, and also the internal surface of the Fallopian tube at the time of the passage of the ovum. The dilatation of this tube at a small distance from the fimbriae, seems to be both for the reception of the ovum and of the semen; and it is probable that the ovum is retained there for several days, so as to prolong the opportunity of its being impregnated.

The formation of ova in the ovaria, and their appearing in that organ in succession, induces the author to entertain an opinion contrary to that commonly received respecting menstruation, which has been considered as a necessary preparatory step for utero-gestation, whereas the present case shows that such periods are not connected with the formation of the ovum, the process of its leaving the ovary, or its impregnation. When, however, impregnation does not take place, such a discharge seems necessary for the relief of parts to which there had been so copious a determination of blood.

The paper concludes with Mr. Bauer's account of the appearance of the ovum, and of the drawings which are annexed to the paper.

*Some farther Observations on the Use of the Colchicum autumnale in Gout.* By Sir Everard Home, Bart. V.P.R.S. Read May 8, 1817. [*Phil. Trans.* 1817, p. 262.]

When the infusion of colchicum is kept for some time, it throws down a sediment, in which the purgative qualities of the root appear